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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,867	02/07/2005	Alexander Katsevich	UCF 456US	8547
23717	7590	06/07/2006	EXAMINER	
LAW OFFICES OF BRIAN S STEINBERGER 101 BREVARD AVENUE COCOA, FL 32922			CORBETT, JOHN M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/523,867	Applicant(s) KATSEVICH, ALEXANDER	
	Examiner John M. Corbett	Art Unit 2882	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 10-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-25 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 26-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Allowable Subject Matter***

1. The indicated allowability of claim 8 is withdrawn in view of reconsideration of reference Zeng et al. (5,170,439).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-5, 7-8, 26 and 30-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Zeng et al. (5,170,439).

With respect to claim 1, Zeng et al. ('439) teaches a method of reconstructing images (Col. 2 lines 18-20) from data provided by at least one detector (10), comprising the steps of: rotating a scanner in a single curve within a plane about a stationary object while scanning the object (Col. 2 lines 20-24 and Col. 3 lines 36-44); scanning the object along a line transversal to the plane with the scanner (Col. 2 lines 20-24, Col. 3 lines 36-44 and Col. 7 lines 48-50); and reconstructing an exact image of the scanned object (Col. 1 lines 49-62 and Col. 2 lines 23-25) with a convolution (Equation 10 and Col. 7 lines 25-26) based FBP (Filtered Back Projection) algorithm (Equation 10); storing 1 cone beam (CB) projection in memory at a time (Col. 4 lines 16-17); and using one family of lines for the step of reconstructing. (Col. 7 lines 26-36)

With respect to claim 3, Zeng et al. ('439) further teaches wherein the single curve includes the step of: rotating a gantry (20) about a portion of the object (18). (Col. 3 lines 36-40)

With respect to claim 4, Zeng et al. ('439) further teaches wherein the single curve includes the step of: rotating between approximately 5 degrees up to approximately 360 degrees. (Abstract lines 3-4)

With respect to claim 5, Zeng et al. ('439) further teaches the step of: rotating over approximately 360 degrees about the object. (Abstract lines 3-4)

With respect claim 7, Zeng et al. ('439) further teaches wherein the step of reconstructing further includes the step of: shift invariant filtering of the cone beam projections (52c and Col. 4 lines 59-61); and back projection updating the image of the scanned object. (74c)

With respect to claim 8, Zeng et al. ('439) further teaches wherein the step of storing at least 1 cone beam (CB) projection includes the steps of: approximately 2 to approximately 4 cone beam (CB) projections in memory at a time. (Col. 4 lines 16-19 and items 42(c) and 42(l))

With respect to claim 26, Zeng et al. ('439) teaches a method of reconstructing images (Col. 2 lines 18-20) from data provided by at least one detector (10), comprising the steps of: scanning the object with a planar curved scan (Col. 2 lines 20-24 and Col. 3 lines 36-44) and a

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line scan by at least one detector (Col. 2 lines 20-24 and Col. 3 lines 36-44); storing 1 cone beam (CB) projection in memory at a time (Col. 4 lines 16-17); and using one family of lines for reconstructing (Col. 7 lines 26-36) an exact image of the scanned object (Col. 1 lines 49-62 and Col. 2 lines 23-25) with a convolution based FBP (Filtered Back Projection) algorithm.  
(Equation 10)

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With respect to claim 30, Zeng et al. ('439) further teaches the step of: providing a gantry (10) for the scanning of the object.

With respect to claims 31 and 32, Zeng et al. ('439) further teaches wherein the planar curve scan includes: at least a full circle scan about the object or wherein the planar curve scan includes: less than a full circle scan about the object. (Col. 2 lines 20-24)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. ('439) as applied to claims 1 and 26 above, and further in view of Bradcovich et al. (4,426,578).

With respect to claims 2 and 29, Zeng et al. ('439) teaches the method as recited above. Zeng et al. ('439) further teaches wherein the single curve includes the step of: rotating an imaging device about a portion of the object. (Col. 3 line 38 and Col. 4 lines 16-17) Zeng et al. ('439) fails to teach an imaging device mounted on a C-arm.

Bradcovich et al. teaches an imaging device mounted on a C-arm. (Fig. 1)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Zeng et al. ('439) to include the C-arm of Bradcovich et al. since a person would have been motivated to have a method in which the detector can be quickly and easily positioned with minimum inconvenience to the patient and ease to the operator (Col. 1 lines 31-34) as taught by Bradcovich et al.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. ('439) as applied to claim 1 above, and further in view of Morgan et al. (5,834,780) and Bradcovich et al.

With respect to claim 6, Zeng et al. ('439) teaches the method as recited above. Zeng et al. ('439) further teaches wherein the rotating and the subsequently scanning the object include the steps of: moving the object through an imaging device and rotating the imager around the object. Zeng et al. ('439) fails to teach moving a table supporting the object and the imaging device mounted on a C-arm.

Zeng et al. ('439) discloses the claimed invention except that the gantry translates instead of the table. Morgan et al. shows that the translation of the table (10) with the gantry fixed in the alternative (Col. 3 lines 55-57) is an equivalent structure known in the art. Therefore, because these two were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a translating gantry with a fixed table for a fixed gantry and a translating table.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Zeng et al. ('439) to include moving a table of Morgan et al. since a person would have motivated to have a method in which tracks were not required thereby removing a trip hazard from the floor and increasing the ability of medical personnel to position support equipment around the patient.

Bradcovich et al. teaches an imaging device mounted on a C-arm. (Fig. 1)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the method of Zeng et al. ('439) to include the C-arm of Bradcovich et al. since a person would have been motivated to have a method in which the detector can be quickly and easily positioned with minimum inconvenience to the patient and ease to the operator (Col. 1 lines 31-34) as taught by Bradcovich et al.

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. ('439) as applied to claim 26 above, and further in view of Zeng et al. (Phys. Med. Biol., 39, 1994, p. 493-507)

With respect to claim 27, Zeng et al. ('439) teaches the method as recited above. Zeng et al. ('439) is silent as to wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan.

Zeng et al. (1994) teaches wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan. (p. 505 lines 10-11)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the method of Zeng et al. ('439) to include the scanning of Zeng et al. (1994) since a person would have been motivated to have an established method of performing scanning so that the patient would be informed before scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. ('439) as applied to claim 26 above, and further in view of Zeng et al. (IEEE Transactions on Nuclear Science, Vol. 44, No. 1, Feb. 1997, p. 98-106)

With respect to claim 28, Zeng et al. ('439) teaches the method as recited above. Zeng et al. ('439) is silent as to wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan.

Zeng et al. (1997) teaches wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan. (p. 100 Col. 1 lines 16-18 and Fig. 1)



It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the method of Zeng et al. ('439) to include the scanning of Zeng et al. (1997) since a person would have been motivated to have an established method of performing scanning so that the patient would be informed before scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. ('439) as applied to claim 26 above, and further in view of Fujise et al. (5,588,036)

With respect to claim 33, Zeng et al. ('439) teaches the apparatus as recited above. Zeng et al. ('439) is silent as to consecutively scanning the object.

Fujise et al. teaches consecutively scanning the object. (Col. 1 line 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Zeng et al. ('439) to include the consecutive scanning of Fujise et al. since a person would have been motivated to have a method of better monitoring time-dependent changes such as the progress or healing of a diseased patient (Col. 1 lines 24-35) as taught by Fujise et al.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 4-5, 7-8, 26 and 31-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 and 4 of U.S. Patent No. 6,771,733 in view of Zeng et al. ('439).

With respect to claim 1, U.S. Patent No. 6,771,733 claims a method of reconstructing images from data provided by at least one detector, comprising the steps of: reconstructing an exact image of the scanned object with a convolution based FBP (Filtered Back Projection)

algorithm. (Claims 1-2 and 4) U.S. Patent No. 6,771,733 fails to claim rotating a scanner in a single curve within a plane about a stationary object while scanning the object; scanning the object along a line transversal to the plane with the scanner; storing 1 cone beam (CB) projection in memory at a time; and using one family of lines for the step of reconstructing.

Zeng et al. ('439) teaches rotating a scanner in a single curve within a plane about a stationary object while scanning the object (Col. 2 lines 20-24 and Col. 3 lines 36-44); scanning the object along a line transversal to the plane with the scanner (Col. 2 lines 20-24, Col. 3 lines 36-44 and Col. 7 lines 48-50); storing 1 cone beam (CB) projection in memory at a time (Col. 4 lines 16-17); and using one family of lines for the step of reconstructing. (Col. 7 lines 26-36)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to modify the claims of U.S. Patent No. 6,771,733 to include the method of scanning and reconstructing of Zeng et al. ('439) since a person would have been motivated to have a method of generating three-dimensional images from cone-beam data, the resulting image of which is relatively free from artifacts and distortions and calculated in an efficient manner (Col. 2 lines 50-57) as taught by Zeng et al. ('439)

With respect to claim 4, Zeng et al. ('439) further teaches wherein the single curve includes the step of: rotating between approximately 5 degrees up to approximately 360 degrees. (Abstract lines 3-4)

With respect to claim 5, Zeng et al. ('439) further teaches the step of: rotating over approximately 360 degrees about the object. (Abstract lines 3-4)

With respect claim 7, Zeng et al. ('439) further teaches wherein the step of reconstructing further includes the step of: shift invariant filtering of the cone beam projections (52c and Col. 4 lines 59-61); and back projection updating the image of the scanned object. (74c)

With respect to claim 8, Zeng et al. ('439) further teaches wherein the step of storing at least 1 cone beam (CB) projection includes the steps of: approximately 2 to approximately 4 cone beam (CB) projections in memory at a time. (Col. 4 lines 16-19 and items 42(c) and 42(l))

With respect to claims 26 and 31-32, U.S. Patent No. 6,771,733 claims a method of reconstructing images from data provided by at least one detector, comprising the steps of: scanning the object by at least one detector; reconstructing an exact image of the scanned object with a convolution based FBP (Filtered Back Projection) algorithm. (Claims 1-2 and 4) U.S. Patent No. 6,771,733 fails to claim scanning the object with a planar curved scan and a line scan; storing 1 cone beam (CB) projection in memory at a time; and using one family of lines for reconstructing. Patent No. 6,771,733 further fails to claim wherein the planar curve scan includes: at least a full circle scan about the object or wherein the planar curve scan includes: less than a full circle scan about the object.

Zeng et al. ('439) teaches scanning the object with a planar curved scan and a line scan (Col. 2 lines 20-24 and Col. 3 lines 36-44); storing 1 cone beam (CB) projection in memory at a time (Col. 4 lines 16-17); and using one family of lines for reconstructing (Col. 7 lines 26-36). Zeng et al ('439) further teaches wherein the planar curve scan includes: at least a full circle scan

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about the object or wherein the planar curve scan includes: less than a full circle scan about the object. (Col. 2 lines 20-24)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to modify the claims of U.S. Patent No. 6,771,733 to include the method of scanning and reconstructing of Zeng et al. ('439) since a person would have been motivated to have a method of generating three-dimensional images from cone-beam data, the resulting image of which is relatively free from artifacts and distortions and calculated in an efficient manner (Col. 2 lines 50-57) as taught by Zeng et al. ('439)

9. Claim 27 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1-2 and 4 of U.S. Patent No. 6,771,733 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Zeng et al. (Phys. Med. Biol., 39, 1994, p. 493-507)

With respect to claim 27, U.S. Patent No. 6,771,733 as modified above claims a method as recited above. U.S. Patent No. 6,771,733 as modified above fails to claim wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan.

Zeng et al. (1994) teaches wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan. (p. 505 lines 10-11)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,771,733 as modified above to include the scanning of Zeng et al. (1994) since a person would have been motivated to have an

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established method of performing scanning so that the patient would be informed before scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

10. Claim 28 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 and 4 of U.S. Patent No. 6,771,733 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Zeng et al. (IEEE Transactions on Nuclear Science, Vol. 44, No. 1, Feb. 1997, p. 98-106)

With respect to claim 28, U.S. Patent No. 6,771,733 as modified above claims a method as recited above. U.S. Patent No. 6,771,733 as modified above fails to claim wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan.

Zeng et al. (1997) teaches wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan. (p. 100 Col. 1 lines 16-18 and Fig. 1)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,771,733 as modified above to include the scanning of Zeng et al. (1997) since a person would have been motivated to have an established method of performing scanning so that the patient would be informed before scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

11. Claim 33 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2 and 4 of U.S. Patent No. 6,771,733 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Fujise et al. (5,588,036)

With respect to claim 33, U.S. Patent No. 6,771,733 as modified above claims a method as-recited above-U.S. Patent No. 6,771,733 as modified fails to claim consecutively scanning the object.

Fujise et al. teaches consecutively scanning the object. (Col. 1 line 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,771,733 as modified above to include consecutive scanning of Fujise et al. since a person would have been motivated to have a method of better monitoring time-dependent changes such as the progress or healing of a diseased patient (Col. 1 lines 24-35) as taught by Fujise et al.

12. Claims 1, 4-5, 7-8, 26 and 31-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 4-6 of U.S. Patent No. 6,804,321 in view of Zeng et al. ('439).

With respect to claim 1, U.S. Patent No. 6,804,321 claims a method of reconstructing images from data provided by at least one detector, comprising the steps of: reconstructing an exact image of the scanned object with a convolution based FBP (Filtered Back Projection) algorithm; storing 1 cone beam (CB) projection in memory at a time; and using one family of

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lines for the step of reconstructing. (Claims 1 and 6) U.S. Patent No. 6,804,321 fails to claim rotating a scanner in a single curve within a plane about a stationary object while scanning the object; scanning the object along a line transversal to the plane with the scanner.

Zeng et al. ('439) teaches rotating a scanner in a single curve within a plane about a stationary object while scanning the object (Col. 2 lines 20-24 and Col. 3 lines 36-44); scanning the object along a line transversal to the plane with the scanner (Col. 2 lines 20-24, Col. 3 lines 36-44 and Col. 7 lines 48-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to modify the claims of U.S. Patent No. 6,804,321 to include the method of scanning and reconstructing of Zeng et al. ('439) since a person would have been motivated to have a method of generating three-dimensional images from cone-beam data, the resulting image of which is relatively free from artifacts and distortions and calculated in an efficient manner (Col. 2 lines 50-57) as taught by Zeng et al. ('439)

With respect to claim 4, Zeng et al. ('439) further teaches wherein the single curve includes the step of: rotating between approximately 5 degrees up to approximately 360 degrees. (Abstract lines 3-4)

With respect to claim 5, Zeng et al. ('439) further teaches the step of: rotating over approximately 360 degrees about the object. (Abstract lines 3-4)



With respect to claim 7, U.S. Patent No. 6,804,321 further claims wherein the step of reconstructing further includes the step of: shift invariant filtering of the cone beam projections; and back projection updating the image of the scanned object. (Claim 4)

With respect to claim 8, U.S. Patent No. 6,804,321 further claims wherein the step of storing at least 1 cone beam (CB) projection includes the steps of: approximately 2 to approximately 4 cone beam (CB) projections in memory at a time. (Claim 5)

With respect to claims 26 and 31-32, U.S. Patent No. 6,804,321 claims a method of reconstructing images from data provided by at least one detector, comprising the steps of: scanning the object by at least one detector; reconstructing an exact image of the scanned object with a convolution based FBP (Filtered Back Projection) algorithm; storing 1 cone beam (CB) projection in memory at a time; and using one family of lines for reconstructing. (Claims 1 and 6) U.S. Patent No. 6,804,321 fails to claim scanning the object with a planar curved scan and a line scan. Patent No. 6,804,321 further fails to claim wherein the planar curve scan includes: at least a full circle scan about the object or wherein the planar curve scan includes: less than a full circle scan about the object.

Zeng et al. ('439) teaches scanning the object with a planar curved scan and a line scan (Col. 2 lines 20-24 and Col. 3 lines 36-44). Zeng et al ('439) further teaches wherein the planar curve scan includes: at least a full circle scan about the object or wherein the planar curve scan includes: less than a full circle scan about the object. (Col. 2 lines 20-24)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to modify the claims of U.S. Patent No. 6,804,321 to include the method of scanning and reconstructing of Zeng et al. ('439) since a person would have been motivated to have a method of generating three-dimensional images from cone-beam data, the resulting image of which is relatively free from artifacts and distortions and calculated in an efficient manner (Col. 2 lines 50-57) as taught by Zeng et al. ('439)

13. Claim 27 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 and 6 of U.S. Patent No. 6,804,321 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Zeng et al. (Phys. Med. Biol., 39, 1994, p. 493-507)

With respect to claim 27, U.S. Patent No. 6,804,321 as modified above claims a method as recited above. U.S. Patent No. 6,804,321 as modified above fails to claim wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan.

Zeng et al. (1994) teaches wherein the scanning step includes the step of: scanning by the planar curved scan before the line scan. (p. 505 lines 10-11)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,804,321 as modified above to include the scanning of Zeng et al. (1994) since a person would have been motivated to have an established method of performing scanning so that the patient would be informed before

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scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

14. Claim 28 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 6 of U.S. Patent No. 6,804,321 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Zeng et al. (IEEE Transactions on Nuclear Science, Vol. 44, No. 1, Feb. 1997, p. 98-106)

With respect to claim 28, U.S. Patent No. 6,804,321 as modified above claims a method as recited above. U.S. Patent No. 6,804,321 as modified above fails to claim wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan.

Zeng et al. (1997) teaches wherein the scanning step includes the step of: scanning by the line scan before the planar curved scan. (p. 100 Col. 1 lines 16-18 and Fig. 1)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,804,321 as modified above to include the scanning of Zeng et al. (1997) since a person would have been motivated to have an established method of performing scanning so that the patient would be informed before scanning began thereby comforted by knowing before hand what series of motions the scanner would perform during the scanning process.

15. Claim 33 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 6 of U.S. Patent No. 6,804,321 in view of Zeng et al. ('439) as applied to claim 26 above and further in view of Fujise et al. (5,588,036)

With respect to claim 33, U.S. Patent No. 6,804,321 as modified above claims a method as recited above. U.S. Patent No. 6,804,321 as modified above fails to claim consecutively scanning the object.

Fujise et al. teaches consecutively scanning the object. (Col. 1 line 27)

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to incorporate into the claims of U.S. Patent No. 6,804,321 as modified above to include consecutive scanning of Fujise et al. since a person would have been motivated to have a method of better monitoring time-dependent changes such as the progress or healing of a diseased patient (Col. 1 lines 24-35) as taught by Fujise et al.

***Allowable Subject Matter***

16. Claims 10-25 are allowed.

17. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 10, the prior art does not teach or fairly suggest identifying lines on a plane  $\pi$  intersecting the cone beam, wherein the step of identifying lines includes the steps of:

(a) if the x-ray source belongs to the line scan, project the planar curve scan onto  $\pi$  and choose a discrete set of lines tangent to that projection;

(b) if the x-ray source belongs to the planar curve scan, project the planar curve scan onto  $\pi$  and choose a discrete set of lines parallel to that projection;

taken in combination with all other elements in the claim. Claims 11-15 are allowed by virtue of their dependency.

With respect to claim 16, the prior art does not teach or fairly suggest identifying lines on a plane  $\pi$  intersecting the cone beam, wherein the step of identifying lines includes the steps of:

(a) if the x-ray source belongs to the line portion of the scan, project the planar curve portion of the scan onto  $\pi$  and choose a set of lines tangent to that projection;

(b) if the x-ray source belongs to the planar curve portion of the scan, project the planar curve portion of the scan onto  $\pi$  and choose a set of lines parallel to that projection;

taken in combination with all other elements in the claim. Claims 17-25 are allowed by virtue of their dependency.

### ***Response to Arguments***

18. Applicant's arguments filed 16 February 2006 have been fully considered but they are not persuasive.

With respect to claim 1, the Applicant argues that the reference Zeng et al. ('439) does not disclose the convolution-based FBP structure. The Examiner disagrees. Applicant is directed to Equation (10).

With respect to claim 7, the Applicant argues that the reference Zeng et al. ('439) does not disclose spatially invariant filtering. The Examiner disagrees. The Applicant is directed to item 52c of Fig. 1B and Col. 4 lines 59-61 where for the circular orbit, the filter is spatially invariant.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M. Corbett whose telephone number is (571) 272-8284. The examiner can normally be reached on M-F 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

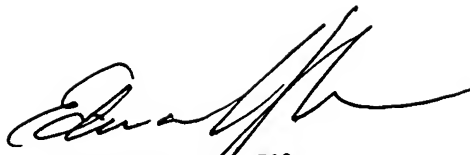
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A handwritten mark or signature, possibly initials, consisting of a stylized 'E' or similar character.A handwritten signature in cursive script, appearing to read 'Edward J. Glick'.

**EDWARD J. GLICK**  
**SUPERVISORY PATENT EXAMINER**